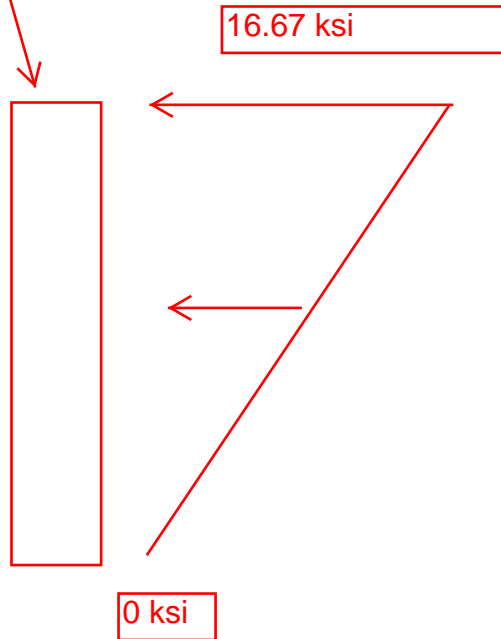


1" wide x12" tall
plate. $S=24 \text{ in}^3$,
 $A=12 \text{ in}^2$.



If I'm trying to determine what forces are acting on this section based on the stress profile alone then it DOES make a difference where you sum moments about.

If I sum moments about the neutral axis, the moment will be $M = 0.5 \cdot 16.67 \cdot 12 \cdot (12 \cdot 2/3) = 800 \text{ k-in.}$

If I sum moments about the centroidal axis, the moment will be $M = 0.5 \cdot 16.67 \cdot 12 \cdot (12 \cdot 2/3 - 6) = 200 \text{ k-in.}$

These two approaches result in drastically different outcomes and do demonstrate that it matters where you take moments about when there is an applied axial load and you only have a strain/stress profile to work with.